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Please amend the claims as follows:

Cancel claims 1-23.

Please add new claims 24-57 as follows.

- 24. (New) A process for producing bitumen having improved physicochemical properties comprising the steps of:
- (a) combining amorphous silica with a coupling agent to produce a functionalized amorphous silica; and
 - (b) mixing the functionalized amorphous silica with bitumen.
- 25. (New) The process of claim 24, further comprising the step of heating the bitumen to a temperature of between about 120°C to about 190°C prior to mixing the functionalized amorphous silica with the bitumen.
- 26. (New) The process of claim 25, wherein the amorphous silica is a natural silica or a precipitated silica.
- 27. (New) The process of claim 26, wherein the amorphous silica is functionalized using a coupling agent selected from the group consisting of silicon, an alkylsilicon, an aminosilicon, a thiosilicon, an epoxysilicon and mixtures thereof.
- 28. (New) The process of claim 27, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.01% and about 20% by weight compared to the weight of the bitumen formulation.
- 29. (New) The process of claim 28, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.1% and about 7% by weight compared to the weight of the bitumen formulation.
- 30. (New) The process of claim 28, wherein the amorphous silica is a precipitated silica in the form of essentially spherical balls having an average size of at least 80 microns.
- 31. (New) The process of claim 30, wherein the amorphous silica is a low water uptake silica.
- 32. (New) The process of claim 24, further comprising the step of mixing an aggregate material with the bitumen.
- 33. (New) The process of claim 24, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.

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- 34. (New) The process of claim 33, wherein the quantity of coupling agent combined with the amorphous silica is between about 5% to about 15% by weight compared to the weight of the amorphous silica.
- 35. (New) The process of claim 24, wherein the bitumen is selected from the group consisting of asphalt, maltha, a natural bitumen, a pyrobitumen, an artificial bitumen, or mixtures thereof.
- 36. (New) A process for producing an improved bitumen based coating comprising the steps of:
- (a) mixing bitumen, water and an emulsifier at ambient temperature to form a bitumen emulsion;
- (b) adding to the bitumen emulsion an amorphous silica combined with a coupling agent to form a functionalized amorphous silica;
- (c) spreading the bitumen emulsion containing functionalized amorphous silica to obtain a uniform coating; and
 - (d) breaking the bitumen emulsion.
- 37. (New) The process of claim 36, wherein the amorphous silica is a natural silica or a precipitated silica.
- 38. (New) The process of claim 37, wherein the amorphous silica is functionalized using a coupling agent selected from the group consisting of silicon, an alkylsilicon, an aminosilicon, a thiosilicon, an epoxysilicon and mixtures thereof.
- 39. (New) The process of claim 38, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.01% and about 20% by weight compared to the weight of the bitumen formulation.
- 40. (New) The process of claim 39, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.1% and about 7% by weight compared to the weight of the bitumen formulation.
- 41. (New) The process of claim 39, wherein the amorphous silica is a precipitated silica in the form of essentially spherical balls having an average size of at least 80 microns.
- 42. (New) The process of claim 41, wherein the amorphous silica is a low water uptake silica.
- 43. (New) The process of claim 36, further comprising the step of mixing an aggregate material with the bitumen.

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- 44. (New) The process of claim 36, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.
- 45. (New) The process of claim 44, wherein the quantity of coupling agent combined with the amorphous silica is between about 5% to about 15% by weight compared to the weight of the amorphous silica.
- 46. (New) The process of claim 36, wherein the bitumen is selected from the group consisting of asphalt, maltha, a natural bitumen, a pyrobitumen, an artificial bitumen, or mixtures thereof.
- 47. (New) A process for producing an improved bitumen based coating comprising the steps of:
- (a) heating a quantity of bitumen to a temperature of between about 120°C and about 190°C;
- (b) adding to the heated bitumen an amorphous silica combined with a coupling agent to form a functionalized amorphous silica;
- (c) mixing the bitumen/functionalized amorphous silica, water and an emulsifier to form a bitumen emulsion;
- (d) spreading the bitumen emulsion containing functionalized amorphous silica to obtain a uniform coating; and
 - (e) breaking the bitumen emulsion.
- 48. (New) The process of claim 47, wherein the amorphous silica is a natural silica or a precipitated silica.
- 49. (New) The process of claim 48, wherein the amorphous silica is functionalized using a coupling agent selected from the group consisting of silicon, an alkylsilicon, an aminosilicon, a thiosilicon, an epoxysilicon and mixtures thereof.
- 50. (New) The process of claim 49, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.01% and about 20% by weight compared to the weight of the bitumen formulation.
- 51. (New) The process of claim 50, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.1% and about 7% by weight compared to the weight of the bitumen formulation.
- 52. (New) The process of claim 50, wherein the amorphous silica is a precipitated silica in the form of essentially spherical balls having an average size of at least 80 microns.

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- 53. (New) The process of claim 52, wherein the amorphous silica is a low water uptake silica.
- 54. (New) The process of claim 47, further comprising the step of mixing an aggregate material with the bitumen.
- 55. (New) The process of claim 47, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.
- 56. (New) The process of claim 55, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.
- 57. (New) The process of claim 47, wherein the bitumen is selected from the group consisting of asphalt, maltha, a natural bitumen, a pyrobitumen, an artificial bitumen, or mixtures thereof.